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European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 95 91 8190

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 501 379 (KYOWA HAKKO KOGYO CO.,LTD) * page 1 * & JP-A-04 346 986 (KYOWA HAKKO KOGYO CO.,LTD)	1	C07D473/04 C12P17/18 C07D473/06 //A61K31/52
A	EP-A-0 541 120 (KYOWA HAKKO KOGYO CO., LTD) * page 1 - page 3 *	1	
A	EP-A-0 560 354 (KYOWA HAKKO KOGYO CO., LTD) * page 1 - page 2 *	1	
A	CHEMICAL ABSTRACTS, vol. 118, no. 25, 21 June 1993 Columbus, Ohio, US; abstract no. 254632t, page 852; column r; XP002010672 * abstract * & JP-A-04 346 986 (KYOWA HAKKO KOGYO CO., LTD)	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) C07D C12P
P,A	EP-A-0 619 316 (KYOWA HAKKO KOGYO CO., LTD) * page 1 - page 2 *	1	

The supplementary search report has been drawn up for the claims attached hereto.

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 October 1996	Luyten, H

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

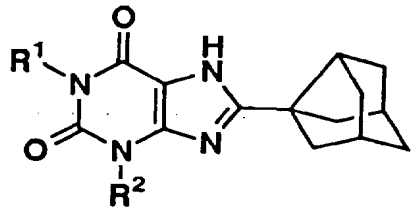
& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C06)

AMENDED CLAIMS

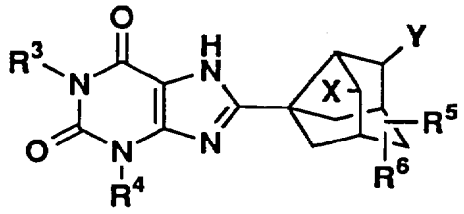
CLAIMS

1. A process for producing a xanthine derivative represented by formula (II), comprising converting a xanthine derivative represented by formula (I) (hereinafter, referred to as Compound (I)):



(I)

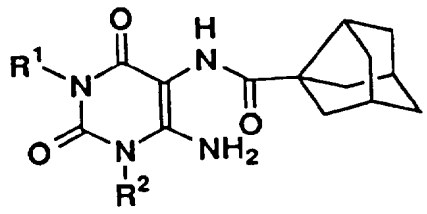
(wherein R^1 and R^2 independently represent hydrogen, or hydroxy-substituted, oxo-substituted, or unsubstituted lower alkyl) into a xanthine derivative represented by formula (II) (hereinafter, referred to as Compound (II)):



(II)

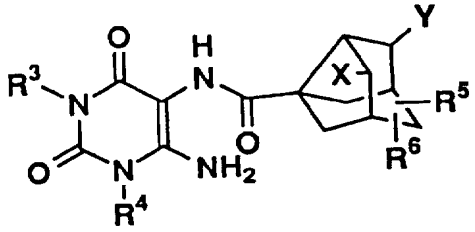
(wherein R^3 and R^4 independently represent hydrogen, or hydroxy-substituted, oxo-substituted, or unsubstituted lower alkyl; R^5 and R^6 independently represent hydrogen, hydroxy, or oxo; with the proviso that when R^5 and R^6 are both hydrogen, at least one of R^3 and R^4 is hydroxy-substituted or oxo-substituted lower alkyl; and X and Y both represent hydrogen or are combined with each other to form a single bond) in the presence of an enzyme source for catalyzing hydroxylation or carbonylation of Compound (I) into Compound (II), and collecting the produced Compound (II).

2. A process for producing Compound (II), comprising converting a uracil derivative represented by formula (III) (hereinafter, referred to as Compound (III)):



(III)

(wherein R^1 and R^2 have the same meaning as defined above) into a uracil derivative represented by formula (IV) (hereinafter, referred to as Compound (IV)):



(IV)

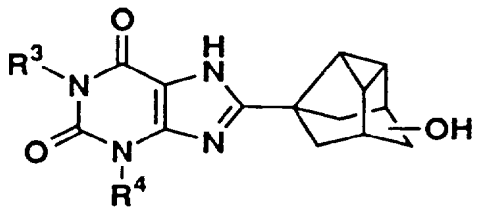
(wherein R^3, R^4, R^5, R^6, X, and Y have the same meaning as defined above) in the presence of an enzyme source for catalyzing hydroxylation or carbonylation of Compound (III) into Compound (IV), and closing the ring of Compound (IV) by dehydration.

3. A production method according to any of Claims 1 and 2, wherein R^1 and R^2 independently represent hydroxy-substituted, oxo-substituted, or unsubstituted lower alkyl, and R^3 and R^4 independently represent hydroxy-substituted, oxo-substituted, or unsubstituted lower alkyl.

4. A production method according to any of Claims 1 to 3, wherein said enzyme source is derived from microorganisms.

5. A production method according to Claim 4, wherein said microorganisms belong to the genus Absidia, Bacillus, or Beauveria.

6. A xanthine derivative represented by formula (IIa):



(IIa)

(wherein R^3 and R^4 have the same meaning as defined above), or a pharmaceutically acceptable salt thereof.